

Arlyn Andrews

Visiting ATS from the NOAA Global Monitoring Division

**Estimating Greenhouse Gas Emissions and Uptake using
Observations of Atmospheric Distributions and Trends**

Hosted by Chris O'Dell

Friday, October 4, 2013

ATS room 101; Discussion will begin at 11:15am

Refreshments will be served at 10:45am in the weather lab

Accurate measurements of atmospheric carbon dioxide, methane and other species provide an objective basis for evaluating emissions estimates and process models. The Global Monitoring Division of NOAA's Earth System Research Laboratory maintains a global greenhouse gas observation network with a regional emphasis on North America (<http://www.esrl.noaa.gov/gmd/ccgg/index.html>). The network is comprised of remote marine boundary layer, continental tall tower, and mountain-top sites and aircraft vertical-profile sites. Sampling strategies have evolved over time to address emerging science questions and to take advantage of new technologies. These and other data are used in inverse-modeling and data-assimilation studies to estimate surface fluxes, and such top-down flux estimates are compared with bottom-up inventories of known or suspected sources and sinks. Multi-species approaches can potentially assist with source attribution. For example, radiocarbon data provides constraints on fossil-fuel versus biogenic emissions of CO₂, and hydrocarbon measurements help to distinguish agricultural sources of CH₄ from oil and gas emissions. Satellite and ground-based remote sensing observations of greenhouse gas emissions can potentially provide new information about global emissions. We are exploring strategies for combining in situ and remote sensing data in a new Lagrangian data assimilation framework under development at NOAA. The seminar will include highlights from recent studies using NOAA data to estimate CO₂ and CH₄ fluxes at regional to global scales.

Bio: Dr. Arlyn Andrews has measured carbon dioxide from the surface to the stratosphere on a variety of airborne platforms, including NASA's ER-2 aircraft—a modified U-2 spy plane, and high-altitude balloons. She currently works in NOAA's Earth System Research Laboratory where she manages a network of sites for measuring carbon dioxide and related gases from very tall radio and television towers. The goal of the project is to provide a basis for accurate accounting of North America's carbon dioxide balance. Prior to joining NOAA in 2003, she spent four years at NASA's Goddard Space Flight Center helping to develop concepts for satellite carbon dioxide measurements.

Link to colloquium videos and announcement page: <http://www.atmos.colostate.edu/dept/colloquia.php>